ROOF RACK FOR A VEHICLE

Description

The invention relates to a roof rack for a vehicle having at least one tubular rail extending essentially at a distance from the roof surface and two supports at the ends of the rails to attach the roof rack to the vehicle roof.

It is known to construct a roof rack for vehicles from one rail on each side of the roof. Each rail has supporting feet in its end areas which in turn can be anchored to the vehicle.

The object of the invention is to create a simple roof rack with a high load capacity.

To achieve this objective, it is proposed under the invention that the rail is configured to have a curve in its end areas and in the area of each curve it is held from below by a support attached to the rail whose upper side – when viewed in cross-section – forms a flat supporting surface for a matching surface on the rail. In particular the intention is that the matching surface – when viewed in cross-section –also has a flat configuration.

When viewed in a longitudinal section, the upper side of the support runs preferably in an arcuate shape, specifically in a convex curve. A corresponding shape is preferably provided for the matching surface, i.e. when viewed in longitudinal section it has a similarly arcuate shape, in particular a concave curve.

Provision can be preferably made for the support to have a retaining projection which engages the inside of the tubular rail, specifically the end

face of the tubular rail. The cross-sectional profile of the retaining projection can preferably be configured to match the shape of the interior cross-sectional profile of the tubular rail. In this way it is possible to absorb twisting forces acting on the rail without difficulty and further to transfer forces occurring in the longitudinal direction of the roof rack directly into the corresponding support.

It is particulary advantageous if the rail has a step which is held from behind by a section of the support in the area transitioning from a zone assigned to one of the supports to a zone without a support. This rear attachment provides additional support for the rail in the longitudinal direction and thus contributes to the strength of the roof rack.

The intention is specifically that the support is bolted to the rail by means of at least one threaded bolt, wherein the head of the threaded bolt lies in an attachment for the support. The attachment ensures that the bolt head is recessed. The support is attached to the vehicle roof by means of at least one attaching means configured as a bolt. To achieve this, the bolt is screwed into a threaded hole on the support, passing through a mounting structure on the vehicle roof and in this way creating a strong seat.

Preferably the intention is that the support is made up of at least two parts, a mounting plate and a retaining element with the matching surface.

The retaining plate is further formed in one piece with the retaining projection or the latter is attached to the mounting plate.

The drawings explain the invention using two embodiments as a reference.

Figure 1 shows an exploded perspective drawing of a roof rack in the area of its end with a support and

Figure 2 shows a drawing similar to Figure 1 of a further embodiment of a roof rack.

Figure 1 shows a part of a roof rack 1, where only one end area is shown, which can be attached to a vehicle which is not shown. The other opposite end area of the roof rack 1 is shaped in a similar fashion so that it is sufficient to describe only one end area in what follows. The roof rack 1 has a tubular rail 2, preferably configured as a hollow profile, extending essentially at a distance from the vehicle's roof surface. To produce the complete roof rack, two such rails are provided which are attached in the two lateral areas of the vehicle's roof. To attach the rails 2, they exhibit a curve 4 at each end area 3 toward the vehicle roof, which is not shown. In the area of the curve 4, the roof rack 1 has a support 5, whose underside 6 can be attached to the vehicle with suitable attaching means 7.

In the area of the curve 4 an indentation is provided in the form of a step 9, i.e. the underside of the rail is recessed to locate the support 5. Since the rail 2 is preferably configured as a hollow profile, a corresponding interior area of the hollow profile is filled with material during manufacture and the step 9 is then machined so that the contact area of the rail 2 is configured to the support 5 as a supporting wall 10.

From Figure 1 it can be seen that the top side 11 of the support 5 coacting with the supporting wall 10 is flat – when viewed in cross-section – thus forming a flat supporting surface 12. Viewed in longitudinal section, the top side 11 has a convexly curved shape, i.e. the supporting surface 12 – when viewed in the direction of the longitudinal section – is configured with a convex curvature. The matching surface 13 on the

underside 9 of the rail 2 coacting with the supporting surface 12 is shaped to match the supporting surface 12, i.e. it is flat when viewed in cross-section and has a concave curvature when viewed in longitudinal section, so that supporting surface 12 and the matching surface 13 make essentially full contact over their entire surfaces. To attach the support 5, matching mounting holes not shown in detail (see Figure 2) are provided in the support 5, into which threaded bolts 14 are inserted which are tightened in a mating counter thread 15 on the rail 2. The heads of the threaded bolts 14 are recessed in the support 5.

The layout is constructed such that in the assembled state the end face 16 of the rail 2 lies approximately on the level of the underside 6 of the support 5 so that the downward curve 4 of the rail 2 covers the support 5 almost completely in its arc.

To mask the support 5 and the rail 2 from the side, suitable thin-walled trim pieces, not shown, can be provided which are attached with suitable fasteners or which can be snapped into place.

Figure 2 shows a further embodiment of a roof rack 1, wherein only the differences from the embodiment from Figure 1 will be discussed in what follows. Otherwise the explanations given for the embodiment from Figure 1 apply equally to the embodiment from Figure 2. The support 5 has a mounting plate 18 and a retaining element 22. In the installed position, the underside 23 of the retaining element 22 lies on a mounting plate 18 which extends beyond the endmost edge 19 of the retaining element 22 and which has a retaining projection 20 in this area with a cross-sectional profile which matches the interior cross-sectional profile of the tubular rail 2 in the area of its end 21. In the assembled state, the retaining projection 20 of the support 5 engages the end face 16 in the interior of the tubular rail 2. The identically matching cross-sectional profiles prevent

any twisting and the flat cross-section and the curved longitudinal section combine to form a seat between support 5 and underside 8 of the rail 2 to create a joint which is simple in its shape but has a high-load capacity.